

A SYSTEM FOR PROVIDING AUTOMATIC INPUT AND INTERACTION BETWEEN A
BROADCAST AUTOMATION SYSTEM AND A SYSTEM FOR GENERATING
AUDIENCE INTERACTION WITH RADIO PROGRAMMING

FIELD OF THE INVENTION

[0001] The present invention relates to a system for providing audience interaction with broadcast programming, and specifically radio programming; and to influence the selection of broadcast content with the option of providing real-time selection of broadcast content or to provide content to be scheduled at a later time. The invention uniquely interfaces directly with a broadcast station's studio operating system, manipulating the on-air content schedule based on audience interaction through various electronic devices, such as a computer or mobile device or internet enabled car dashboard. The present invention further relates to a software system which links, for example via the internet, a broadcast automation system to an external data source, such as a separate audience participation system for providing audience interaction with broadcast programming, and specifically radio programming. Further this software system works with existing broadcast automation systems and existing audience participation systems to influence the selection of broadcast content with the option of providing real-time selection of broadcast content or to provide content to be scheduled at a later time. The invention interfaces directly with a broadcast station's studio operating system (including a music scheduler, a file system, and an automation system), to manipulate the on-air content schedule and deliver filtered audio files for chosen selections for on-air play based on a surrogate or placeholder placed in a given file location in a playlist generated by the broadcast station's selection scheduling software.

BACKGROUND OF THE INVENTION

[0002] The nature of the broadcast radio competitive landscape has changed significantly over the past decade. New various electronic devices, such as mp3 players, have provided a greater number of options for music and spoken word consumers to enjoy audio content. Whereas 50 years ago, over the airwaves radio was the primary source of audio entertainment and a "radio" was the only means of listening

to radio broadcasts, a multitude of receiver options are presently available to audio listeners. Moreover, CD and MP3 players, as well as the Internet, have given listeners the ability to choose audio content for themselves, leaving broadcast radio working hard to attract and maintain its audience.

[0003] In the past, broadcast radio has instituted methods to allow an audience to participate in content selection, including call-lines and listener surveys. These have helped some radio stations develop or maintain listener loyalty and to maintain market share. However, this has always required a "curator," such as a Disc Jockey or Program Director to aggregate voting information and adjust the radio station's programming using the information collected from the surveys and "phone call-ins." More recently, broadcast systems have adopted automation systems, such as "SS32", "RCS Master Control", "Maestro", "AudioVault", "Nexgen", "WideOrbit", or "Station Playlist" which play selections by utilizing on-air schedules including music, spoken word, and commercials that have been generated by content scheduling software and subsequently exported by a file system to the automation system. However, these broadcast automation systems have the problem that the playlists cannot be automatically changed to provide for audience participation and require the intervention of a human operator who has to over-ride the automation system in order to make changes in the scheduling or playlist. Thus, it has been a problem that certain broadcast automation systems do not allow for the option of automatically using an external data source, such as an audience participation program, to allow the audience to participate in the choice of broadcast content. It has also been a problem that playlists cannot be reliably modified based on a specific/complex set of rules or an algorithm, as human intervention in managing a playlist is fraught with operator error that can negatively impact a radio station's programming.

[0004] The present invention provides a system in which the audience's votes and participation can automatically (i.e., without the need for a person to participate by using a set of rules) manipulate a radio station's music schedule or spoken word programming schedule by interfacing with the radio station's studio operating system and/or programming scheduling software. In particular, this system provides a choice of a given number of selections, and allows audience members to vote on which selection

they prefer to hear. The most popular selection is then routed directly into the radio station's playlist (which resides in the radio station's music scheduling software or studio operating system) as the next play. In addition, the system allows for selections to be "filtered" or culled based on criteria such as selection or artist frequency relative to the scheduled playlist. Additionally, the system can gather "soft", or more passive data, including, for example, information about whether a listener turns the volume up, or switches stations. The present invention also includes a user interface in which a curator, such as a DJ, can review live voting results. The system may also provide logs relating voter interaction, the songs that were played, and other pertinent data relating to the system's interaction with the automation system.

[0005] Members of the audience can be prompted to participate in a vote by alerts, delivered by SMS, IM, or e-mail or by social media including for example but not limited to FaceBook® and Twitter® or by mobile device "apps" or applications directed to programming content or other application based directives. The audience can use various devices to input their vote, such as a computer, work station, PDA, cellular device, cable box, mobile pad, game station, or vehicle infotainment system. In a further embodiment of the invention, members of the audience can upload audio files, which may then be moderated or screened by the radio station staff. Then, those audio files may be available for other listeners to play on demand or stream to their device.

[0006] The present invention also provides a software system in which the audience's votes and participation can automatically (i.e., without the need for a person to participate) manipulate a radio station's music schedule or spoken word programming schedule by interfacing with the radio station's studio operating system including the automation system and/or programming scheduling software. In particular, this system provides a file, which is generated as a choice of a given number of selections upon which audience members were permitted to vote. A chosen selection is then routed directly by means of a placeholder or surrogate file by the invention into the radio station's playlist (which resides in the radio station's music scheduling software or radio automation system) as the next play. Selection is generally dictated by the audience participation system, which can use a variety of criteria for the selection choice. The selection can be chosen from a number of choices by meeting a criteria, such as the

most number of positive votes, the least number of negative votes, or by another defined criteria, such as a geographic or demographic characteristic or even individualized preferences. The audience participation system can include means as part of the voting process to prompt members of the audience to participate in a vote by various means including broadcast alerts, texts, IM, Twitter, or e-mail alerts or other social media.

SUMMARY OF THE INVENTION

[0007] The present invention provides an audience interaction system for broadcast programming, which gathers or otherwise accesses audience input including, for example, votes via an interactive interface accessible through the communication network, which includes various electronic communication methods, such as the internet, telephone and cable, and mobile devices, such as cellular, tablet/e-pads, and PDAs. The present invention then regulates by statistically weighting or balancing audience input using an algorithm, and it interfaces with a radio station's studio automation operating system and/or content scheduling software to automatically affect the scheduling of on-air content. As an example, listeners may vote on which selection (and specifically, which song) should play next on a radio station, then the present invention will interface with the radio station's automation system to manipulate which selection should play at a certain time in the programming lineup. The current system may then also receive information back from the radio station studio system, which may be used to further define the selection playlist or to schedule or process alerts back to listeners that their selection is about to play on the air.

[0008] The present invention also provides for a software link which securely uses the internet to communicate between a broadcast automation system and an external data source. The external data source is advantageously an audience participation or interaction system for broadcast programming, which gathers audience input or characteristics, including, for example, votes via an interactive interface accessible through the communication network, which includes various electronic communication methods, such as the internet, telephone and cable, and mobile devices, such as cellular, tablet/e-pads, and PDAs. The present invention uses a placeholder or surrogate file to stand in the place of the selection which is provided by

the audience participation system and which is ultimately generated by the audience participation system and in response supplied from the broadcast automation system as an audio file to the broadcast automation system for on-air play.

[0009] Thus, the software system of the present invention system includes software that permits the radio station' studio automation system to interact via an external communication means such as the web, with a separate server which hosts the process of selection determination. Specifically, the software monitors a definable location for playlist information, such as new log exports, which are generated by the radio station automation system or a music scheduling program. An example of an acceptable log export is a text-based file containing data that represents the on-air schedule for a broadcast station for a given period. The file is row and comma based where each row in the file (separated by a line-feed character, carriage return character, or combination of both) represents one entry in the schedule. Each row is separated into multiple fields. These fields contain information such as: Media Type, Category, Cart Number, Scheduled Date/Time. A list of multiple selections are replaced by a placeholder selection that is used as a surrogate number/filename for the winning selection. The separate server advantageously conducts the audience interface and stores the resulting data, which are published to a web widget of the radio station to conduct the voting session. The software receives data for the broadcast station, which it uses internally, manipulates it as necessary, and forwards it to the separate server via a web-based API. The software queries the web-based API which provides XML data to convey the current winning selection from the audience participation system using HTTP GET via TCP-IP which are sent back from the separate server to the software system. The software system then copies the contents of the digital audio file of the winning selection to a new file ("placeholder" file) using a file location, which causes the radio station automation system to import the digital audio file. This results in the selection being played on-air when the placeholder file reaches the on-air position of the automation system. The system is not limited to the use of log exports to manage playlist information, and can encompass other methods of transferring information and/or manipulating a live playlist.

[0010] In a separate aspect of the invention which is termed herein an "open selection event", a series of selections can be played. In this aspect of the invention, the audience ranks selections chosen from a defined set. Again, the radio station automation system encounters a command from the separate server, which begins the radio station/software/separate server interaction session. The software queries the server web-based API which provides XML data containing information about which selection or song in the selection voting currently has the most votes. This selection will be the next play when a placeholder file or reserved position is encountered in the on-air schedule, and after play, the software will notify the separate server by a web-based APL so that the separate server resets the votes on that selection and moves it into last place. The next-most voted selection then becomes the top selection, which the software will copy into the next placeholder file. This process repeats until the radio station automation system encounters a command from the separate server to end the song or selection replacement session in the on-air schedule. Then a web-based notification is sent to the separate server to de-activate the song or selection replacement session.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0011]** Figure 1 is diagram of the present invention;
- [0012]** Figure 2 is a representation of the screen which is used to prompt the audience member to participate by triggering the beginning and end of the voting incident; and
- [0013]** Figure 3 is a representation of a web-based control screen.
- [0014]** Figure 4 is diagram of the software link of the present invention;
- [0015]** Figure 5(a) is a representation of a Selector selection log which is generated by a broadcast automation system;
- [0016]** Figure 5(b) is a representation of a Selector selection log after it has been parsed by an audience participation system;
- [0017]** Figure 6 is a representation of a format of XML generated by the broadcast automation system which is received and re-formatted by the software system of the present invention and which are sent to the audience participation system by means of HTTP POST via a web-based API.

DETAILED DESCRIPTION OF THE INVENTION

[0018] Figure 1 shows a schematic view of the audience interaction system in accordance with the present invention. The system shown generally 10 involves an audience interaction user interface or "widget" (which may vary in its appearance) 12 which gathers data from the audience members by means of an input device 14, which could include a mobile device 16 (including specifically but is not limited to a phone or other a cellular device, a pda, an e-pad, a vehicle infotainment system or a lap-top computer in wireless communication such as by means of the internet). The input device could also include stationary devices 18 such as a home computer, a work station, a cable box and a game station. The data is gathered from the mobile or stationary device using the audience interaction user interface or "widget" 12 which is hosted online and may be framed into a radio station website 22. Generally, the data is gathered from the audience members by voting on a selection 24 (including but not limited to audio selections such as songs, news stories, sports information, children's stories, instructions, recipes, and work-out scripts to name a few) or video selections (including but not limited to music videos, news stories, sports information, children's programs, health and fitness videos, and recipes). The audience is asked to select one of the choices for broadcast 26 or prioritize which audio selection should play next out of a list of upcoming selections.

[0019] The invention uses a software program 28, to gather the "Now Playing" or "Currently Playing" selection data 30 from an automation/play-out system at a radio station 32 and to capture the command-cue to begin and end a voting session for the audience interactive "you pick the next song" feature. The audience interaction user interface or "widget" 12 displays information regarding the selection currently being played, for example the title and artist of the song currently playing on the air. Optionally, the widget can display past or future broadcast information, as well as information as to when the next voting session will occur, or information as to results from current or past voting sessions, including for example, the winning choice, the percentage of audience voters who voted for that choice, and the number of times that the choice has won over a set period. The audience interaction user interface may also show information about the artist, composer, or creator of the audience selection,

including, but not limited to latest news, biographies, discographic information, lyrics, or other relevant information.

[0020] Selections can be added to the audience interaction user interface through an admin screen privately accessible by the radio station. The radio station may also upload a list of selections using a comma-delimited text file with a list of selections in a format including artist or performer and title of the selection. This method is preferred for up-loading a larger batch of selections.

[0021] The audience can use the audience interaction user interface or "widget" 20 to view a list of selections made available by the broadcaster and can vote to play those selections at a later point or "on-the-air" as directed by the broadcaster. The broadcaster is given the option for incorporating audience interaction through a playlist management system 40 which includes controls for the playlist module 42, controls to activate various settings related to feeding the radio station studio operating system, a screen to add a selection to the playlist, to start a voting session by adding a "pick next" voting session, to view live voting session results by managing and viewing "pick next" voting sessions, and to generate voting result reports.

[0022] The audience views the list of selections on the audience interaction user interface ("widget"). The audience can rate and request selections from this screen and receive notifications or alerts such as by e-mail, instant messenger, sms text or social media including Facebook® or Twitter® of when requested selections will play on air. The broadcaster can use the playlist management system to remove a selection from the audience interactive system library including permanently removing the selection from the library.

[0023] The broadcaster uses the playlist management system 40 to provide the choice of selections and configure how the audience will be allowed to interact with the playlist selections. The broadcaster may also use their music scheduling software to schedule voting sessions using commands such as "UpickStart," "LDR Vote Options Start," "LDR Vote Options End", "Begin Song Replacement", and "End Song Replacement." These are commands unique to the present invention that can identify specific positions in a schedule where the audience may choose elements (such as songs). When a 30 broadcaster's automation system or audio playback system sends

the appropriate command through its now playing data feed, the next voting options are immediately placed on the "You pick the next selection" screen of the audience interaction user interface / widget 20. The management system allows the broadcaster to watch the live voting session or to reload votes to see up-dated results at any time. The vote can be set for a specified length of time, such as by automation, or can be closed manually by signaling the playlist management system to close the voting. The 30 radio station automation system may also connect with a 34 automation command system using an API (application protocol interface), which will supply information on which element is to be played on the air at a specified time.

[0024] The playlist management system allows the broadcaster to see the results from audience voting by requesting reports, which can be filtered by set periods of time, including the last 24 hours, the last 7 days or the last 30 days.

[0025] The playlist management system includes the ability to vary the amount of input that an audience is given, such as by making a selection "requestable" which determines selections that can be requested and voted on, or "UPickable" which determines selections that will be part of the "you pick the next selection" voting. It also uses an algorithm to recommend which songs should be played more or less to the broadcaster, based on audience impact data from voting sessions or request quantities which is determined from audience request tallies.

[0026] Depending on the configuration chosen by the broadcaster, the Audience Interaction User Interface 26 may also show a list of elements which have the potential to play in the future, where the audience can register several positive and negative votes for elements by prioritizing which ones should play sooner or later in the schedule.

[0027] In order to accommodate input 34 from the automation command system, various commands are scheduled in the radio station's programming logs. Those commands 30 are sent by the radio station automation system to the present invention's automation command system to cue the start and end of voting sessions and features on the audience interactive user interface ("widget.") The automation command system 32 provides information 31 to the radio station automation system as to which selection received the most votes and should be played next on the air. The winning selection will

air and the automation system 32 will automatically save the changes to the pre-programmed playlist and will allow for reconciliation of the schedule.

[0028] An algorithm 29 is used, so that winners will be selected only if they pass both the unbreakable and breakable rules configured in the playlist management system. The playlist is subsequently reconciled, which should take a minute or two per day's schedule.

[0029] The invention further includes a feature which allows the playlist management system to place a song which is "most requested" into the music schedule. Again, the "Most requested" command is placed in a fixed position on the radio station's schedule. Following a command to the playlist management system, it will replace the fixed position with the "Most requested" selections, providing that they pass all of the unbreakable and breakable rules noted in the playlist management system.

[0030] An additional aspect of the present invention is that it allows audience members to up-load selections, such as their own songs, which can be up-loaded as an MP3, AC3, Wav, or OGG format file. The selection goes first to the Program Director for approval in the playlist management system. These selections can be viewed on the administrative screen. Following review the songs can be mark approved, disapproved or undecided. They can further be marked approved/streaming enabled and can be placed automatically on the audience interactive user interface for streaming. The radio station may also play the audio on the air along with information such as the selection title and band name, which is preferably provided as metadata when the selection is downloaded.

[0031] Figure 2 illustrates a "UPickStart" screen for "Breaknotes" which can be used to create breaknotes and to help trigger the a voting the beginning and end of a voting incident. The selection choices can be selected by a variety of means, such as by selecting specific songs or using themes by which songs are categorized.

[0032] Figure 3 illustrates the Web-Based Control Screen that helps to generate a "Rate-And Request" song screen that allows the audience to view a list of selections that the radio station has chosen and to vote to play those songs on the air.

[0033] Figure 4 shows a schematic view of the software system in accordance with the present invention in the context of the interaction between the external data source

and specifically, the audience participation system, and the broadcast automation system. While the invention is described with respect to a separate and external audience participation system (i.e. which is implemented and managed apart from the broadcast station), it should be understood that the data source can be internal to the broadcast station and operate as part of the automation system and where the link of the present invention is used as a mechanism to import files external to the initial playlist, file system, and/or automation system.

[0034] The software system of the present invention uses a surrogate or placeholder which is an entry in a log export file (and thus an on-air schedule) that will later be replaced by another selection. The log export file is a text-based file which uses row and comma format for data that represents the on-air schedule for a broadcast station for a given period, such as a broadcast day. The schedule is generally created in a music scheduler first and then exported to a broadcast automation system. Each placeholder has a category and/or number that correspond to a file on the file system from which the chosen selection can be played by the broadcast automation system. The invention subsequently copies the selection's file contents into this placeholder file to cause that selection to be played. In the log export file, each row in the file is separated by a line-feed character, carriage return character, or combination of both and represents one entry in the schedule. Each row is separated into multiple fields, which are separated by commas. These fields contain information such as Media Type, Category, Cart Number, and Scheduled Date/Time.

[0035] The software system, shown generally at 10, further interacts such as by way of the internet 112, with an external data source, which is specifically an audience participation system shown generally at 114. The audience participation system allows the audience to indirectly interact with the broadcast station operating system 115 which includes an automation system 116, a file system 117 and a music scheduler 118. One type of interaction that can be used to gather data to modify an on-air schedule is a voting session in which a group of songs are provided by the broadcast station, placed in the on-air schedule, and read by the audience participation system to enable it to create a voting session which can be viewed and voted upon by the audience using a web-based application. The voting session is conducted by the audience participation

system 114 for a given period, and when it ends, the votes are tallied and the winning selection can be supplied by the software system 110 using the internet 112 to the broadcast station operating system 115 to be played on the air.

[0036] Another type of audience interaction is an open selection event which gives the audience the ability to vote upon a larger number of selections and to rank the selections. The selections are supplied to the broadcast automation system in an order, such as by popularity, and played on-air according to that order. After a selection has been played, it is moved to the end of the list and the next selection is played in the next available placeholder spot. This type of interaction can continue for a selected amount of time, i.e. while the interaction between the broadcast station automation system and the audience participation system remains linked or "open" by the software system of the present invention so that a number of selections are supplied during an open selection event.

[0037] The audience participation system uses a software program, to gather the "Now Playing" or "Currently Playing" selection data which includes the title, artist and other information representing the selection that is currently playing on-air on the broadcast station. The broadcast automation system generally sends the "now Playing" data in a single format, but the software of the present invention has the ability to forward this information in a variety of different formats to multiple sources using a variety of protocols, such as XML over TCP/IP. The audience participation system uses various commands or entries into the on-air-schedule to determine when certain events will happen, including the start of a given voting session which exists in a 0-second audio file, vote option start and end commands that combine to denote a list of selections that are available in a voting session, and for open selection event, the begin selection replacement and end selection replacement commands that begin and end the open selection event.

[0038] The linking software uses a placeholder or surrogate in a log export file to allow the external data source to communicate with the station broadcast automation system. The placeholder is an entry in the log export file (and thus in the on-air schedule) that will later be replaced by a selection. This event is illustrated in Figures 5(a) and 5(b). Each placeholder has a category and/or number that correspond to a file

on the file system from which the chosen selection can be played by the automation system. The linking software of the present invention copies an audio file content from the broadcast station file system into the placeholder file to make that audio file play.

[0039] The audience can use the audience interaction user interface or "widget" to view a list of selections made available by the broadcaster and can vote to play those selections at a later point or "on-the-air" as directed by the broadcaster. The broadcaster is given the option for incorporating audience interaction through a playlist management system which includes controls for the playlist module, controls to activate various settings related to feeding the radio station studio operating system, a screen to add a selection to the playlist, to start a voting session by adding a "pick next" voting session, to view live voting session results by managing and viewing "pick next" voting sessions, and to generate voting result reports.

[0040] The software linking system 110 of the present invention includes four major components, each responsible for a separate process, that can be combined together to create the functionality required to enable the broadcast station automation system to play a selection chosen through a voting session or an open selection event.

[0041] The first component is a log parsing component which monitors a definable location (directory) for new log exports generated by the broadcast station selection scheduling program. That schedule is forwarded to the external data source, i.e. the audience participation system 110, and modified such that the multiple selections which will be included in a voting session are replaced with a place holder which will later be used as a surrogate number/filename for the winning selection. The voting sessions for each day are stored in a database on the audience participation server and are published to the station's web widget for public voting. Figure 5(a) and 5(b) illustrate an example of a voting session before and after the log parsing taken from a Selector music log intended for an automation manufactured by Scott Studios/dMark/Google /Wide Orbit as defined by these automation manufacturers. Other automation system manufacturer's music import format is likewise supported by the present invention.

[0042] As a second component, the linking system receives Now Playing data from the broadcast station automation system 116, uses this information internally, and forwards this information to the audience participation system via a web-based API.

The information is formatted, for example in XML, and transferred via a TCP/IP connection as a stream of bytes. The format for XML coming from the broadcast station automation system is illustrated in Figure 6. The software linking system re-formats this now playing data, and sends it to the audience participation system via HTTP POST via a web-based API. The data is sent along with authorization credentials (username and password) for security. Some of the HTTP POST parameters used by this API are:

- stationId

A string of characters that identifies the station to the audience participation system

- auth_username

A string of characters representing the username used for authentication

- auth_password

A string of characters representing the password user for authentication

- selectionID

A string of characters that contains the category and cart number of the selection from the broadcast station automation system. These two pieces of data combined identify the selection in the automation system. These two pieces of information are combined into one string and separated by a forward-slash ("/"). The category comes first, followed by the cart number.

Example: S01/0865

- artistName

A string of characters identifying the artist of the selection that is playing

- selectionName

A string of characters identifying the title of the selection that is playing

- timestamp

A string of characters representing the date and time in the automation system at the time at which the selection was played.

The string is in the format of YYYY-MM-DD: HH:II:SS

■ YYYY is year in 4-digit format, "2011"

■ MM is month in 2-digit format, "01" or "12"

■ DD is day in 2-digit format, "01" or "31"

■ HH is hour in 24-hour format, "01" - "23"

- II is minute in 2-digit format, "01" - "59"
- SS is second in 2-digit format: "01" - "59"
- length

An integer representing the number of seconds for which the selection will be playing. The system is not limited to these HTTP Post parameters and may use other parameters to exchange information between the automation system, website, audience user interface, and web based system.

[0043] The third component implements the ability of the software link 110 of the present invention to use a voting session. In this component, using HTTP GET via TCP-IP, the link queries the audience participation system web-based API which provides XML data to convey the current "winner" of the voting session. Details about the HTTP request and the XML are then sent back from audience participation system. Once the winner has been received by the software link, the digital file of the winning selection is copied to a new file ("placeholder" file) using a specific filename and saved to a specific location, which will cause the broadcast station automation system to import it, causing the winning selection to be played when the placeholder (from Component 1,) reaches the on-air position of the automation system.

As an example:

\\automation machine\share\audio_directory\winning_song.wav

would be copied to:

\\automation machine\share\audio_directory\import_location\placeholder_song.w

av

[0044] The fourth component implements the open selection event feature of the present invention. To begin an open selection event, the station broadcast automation system encounters an audience participation system command in the on-air schedule called "Begin Song Replacement". This command is sent to the audience participation system, via its web-based API, and it will begin publishing open selection event data to its API. Using HTTP GET via TCP-IP, the software link system 110 queries the audience participation 114 web-based API which provides XML data containing

information about which selection in open selection event currently has the most votes. This is the next selection that should play on the air during the open selection event. When the most-voted selection changes, the software system 110 of the present invention will copy the contents of the digital audio file which contains that selection into the next placeholder file scheduled to play in the automation system 116. It should be understood that the system could also supply a video file or an audio and video file for broadcast media other than radio and also that song is used herein as an example of a type of selection (along with spoken word or video selections, for example) that could be supplied. When the automation system encounters the placeholder file in the on-air schedule, the current most-voted selection plays on the air. When it plays, the software link sends a notification to the audience participation system 114 via the web-based API, and the audience participation system 114 resets the votes on this selection, putting it in last place. The next most-voted selection becomes the top selection, which the software link will begin copying into the next *placeholder* file. This process repeats until the automation system encounters the audience command "End Selection Replacement" in the on-air schedule. When the automation system 114 encounters the audience participation command "End Selection Replacement" in the on-air schedule, a notification is sent to the audience participation system 114 via the web-based API, and the audience participation system 14 de-activates the open selection event.

[0045] The following section outlines, from start to finish, the process by which each interaction, and subsequent schedule modification, is executed. Numbers in parentheses refer to diagram shown in Figure 4 which shows flow of data through the system.

Voting Sessions

[0046] Broadcast Station personnel creates an on-air schedule for a given day using music scheduling software. Commands for the audience participation system are contained within this schedule.

[0047] The schedule is exported to a text file on the file system 117.

[0048] The software link system 110 of the present invention, while monitoring for new log export files, discovers the new export file and reads it from the file system 117.

[0049] The software link system sends the log export file to the audience participation system 114 API via the HTTP interface. The connection is left open so that the audience participation system 114 server can send information back.

[0050] The audience participation system 114 server reads the audience participation system 114 commands from the export file, and replaces the necessary commands with placeholder selections, which the software link will later change.

[0051] The audience participation system 114 server sends the updated export file (with new placeholders) back to the software link system 110 application through the still-open HTTP connection, then closes the connection.

[0052] The software link system 110 application sends the new export file back to the file system 117 so that the automation system 116 can export it.

[0053] The broadcast automation system 116, while monitoring for new export files, discovers the new export file and reads it from the file system 117, importing the schedule contained within.

[0054] The broadcast automation system 116 plays music and other schedule entries as normal, until it reaches the audience participation system 114 command entry *UPickStart*, which signifies the beginning of a voting session.

[0055] The *UPickStart* command "plays" in the automation system 116, as if it were music, for zero seconds.

[0056] The Now Playing event data for the *UPickStart* command is sent to the broadcast station automation system 116 application.

[0057] The broadcast automation system 116 application sends this event data to the software link system 110 in XML format.

[0058] The software link system 110 forwards this information to the audience participation system 114 API via the HTTP interface.

[0059] The audience participation system 114 server activates the voting session associated with the *UPickStart* command and begins publishing the live results of the voting session to the API.

[0060] The software link system 110 application begins making periodic requests for up-to-date voting session information at a set interval to the audience participation system 114 API via the HTTP interface.

[0061] After each request for new information, if the winning selection (i.e., the selection with the most votes) has changed since the last request, or if this is the first request, the software link system 110 will send a command to the file system 117 to copy the digital audio file containing the winning selection into a new file corresponding to the *placeholder* entry in the on-air schedule. This file is in a special "inbox" directory, a directory from which the file will be read and refreshed by the broadcast station automation system 116, prior to playing on the air.

[0062] The broadcast station automation system 116, while monitoring the file system 117, discovers the new audio file for the *placeholder* entry and loads the data in the file, including metadata such as selection title and artist. The audio file is then queued to play when the automation system 116 encounters the *placeholder* on-air schedule entry.

[0063] When the broadcast station automation system 116 encounters the placeholder on-air schedule entry for the currently active voting session, the most recently queued (from Step 17) audio file for this entry is played.

[0064] The automation system 116 sends this Now Playing event to an automation system 116.

[0065] The automation system 116 sends this Now Playing event, in XML format, to the software link system 110 application.

[0066] The software link system 110 application recognizes this now playing event as the winning selection for the voting session, and stops making audience participation API requests for voting session information.

[0067] The software link system 110 application sends the winning song information to the audience participation system 114 API via the HTTP interface.

[0068] The audience participation system 114 server recognizes that the winning selection has played, and de-activates the voting session.

[0069] Steps 9-23 repeat for each voting session in each on-air schedule.

[0070] After the station has scheduled its daily music log and it has been processed by component 1 of the software link system, a specific file is played by the stations automation system 116 and is sent (via Component 2) to the audience participation system 114 server triggering a voting session on the stations website. Once this

command is received the selections which were scheduled for voting are placed in a custom widget which is embedded into the broadcast stations website. Listeners can vote on the selection they want to play next and those votes are tabulated by audience participation system. The software link system 110 checks into the audience participation system 114 server for the winning selection and as each new winner is determined the winning selection is processed by component 3. Once the winning selection is determined to have played (via component 2) the voting session on the website is closed.

Open Selection Event

[0071] Radio Station personnel creates an on-air schedule for a given day using music scheduling software of the music scheduler 118. Audience participation system 114 commands are contained within this schedule.

[0072] The schedule is exported to a text file on the file system 117.

[0073] The software link system 110, while monitoring for new log export files, discovers the new export file and reads it from the file system 117.

[0074] The software link system 110 sends the log export file to an audience participation system 114 API via the HTTP interface. The connection is left open so that the audience participation system 114 server can send information back.

[0075] The audience participation system 114 server reads the audience participation system 114 commands from the export file, and replaces the necessary commands with placeholder songs, which the software link will later change.

[0076] The audience participation system 114 server sends the updated export file (with new placeholders) back to the software link system 110 application through the still-open HTTP connection, then closes the connection.

[0077] The software application system 110 sends the new export file back to the file system 117 so that the broadcast station automation system 116 can export it.

[0078] The broadcast automation system 116, while monitoring for new export files, discovers the new export file and reads it from the file system 17, importing the schedule contained within.

[0079] The broadcast automation system 116 plays music and other schedule entries as normal, until it reaches the audience participation system 114 command entry *Begin Song Replacement*, which signifies the beginning of an open selection event.

[0080] The *Begin Song Replacement* command “plays” in the automation system 116, as if it were music, for zero seconds.

[0081] The Now Playing event data for the *Begin Song Replacement* command is sent to the broadcast station automation 116 application.

[0082] The broadcast station automation 116 application sends this event data to the software link system in XML format.

[0083] The software link system 10 forwards this information to the audience participation system 114 API via the HTTP interface.

[0084] The audience participation system 114 server activates an open selection event and begins publishing the live results of voting to the API.

[0085] The software system 110 application begins making periodic requests for up-to-date voting information at a set interval to the audience participation system 114 API via the HTTP interface.

[0086] After each request for new information, if the winning selection (e.g., the selection with the most votes or the selection with the least losing votes) has changed since the last request, or if this is the first request, the software link system 110 will send a command to the file system 117 to copy the digital audio file containing the winning selection into a new file corresponding to the *placeholder* entry in the on-air schedule. This file is in a special “inbox” directory, a directory from which the file will be read and refreshed by the automation system 116, prior to playing on the air.

[0087] The broadcast station automation system 116, while monitoring the file system, discovers the new audio file for the placeholder entry and loads the data in the file, including metadata such as song title and artist. The audio file is then queued to play when the automation system 16 encounters the placeholder on-air schedule entry.

[0088] When the broadcast station automation system 116 encounters the next placeholder on-air schedule entry, the most recently queued (from Step 17) audio file for this entry is played.

[0089] The broadcast automation system 116 sends this Now Playing event to the automation system 116.

[0090] The automation system sends this Now Playing event, in XML format, to the software link system 110 application.

[0091] The software link system 110 application sends the selection information to the audience participation system 114 API via the HTTP interface.

[0092] The audience participation system 116 server recognizes that the selection has played, and resets the votes for this selection, so that a new selection is published via the API.

[0093] Steps 9-22 repeat for each open selection event *placeholder* in each on-air schedule, until the *End Song Replacement* command on-air schedule entry is encountered.

[0094] The *End Song Replacement* command "plays" in the automation system 116, as if it were music, for zero seconds.

[0095] The Now Playing event data for the *End Song Replacement* command is sent to the automation system 116 application.

[0096] The automation system 116 application sends this event data to the software link system 110 in XML format (1)

[0097] The software link system 110 recognizes that an open selection event is now turned off, and stops making requests to the audience participation system 114 API for new selection information.

[0098] The software link system 110 forwards this information to the audience participation system 114 API via the HTTP interface (2).

[0099] The audience participation system 114 server de-activates the open selection event.

[00100] While in accordance with the patent statutes the best mode and preferred embodiment have been set forth, the scope of the invention is not limited thereto, but rather by the scope of the attached claims.

WHAT IS CLAIMED IS

1. An audience interaction system which interfaces with a radio station scheduling system which determines a radio station play schedule comprising means to gather audience selection votes, means to regulate the audience selection votes, means to receive information from the radio station scheduling system and an algorithm which processes the audience selection votes and the information from the radio station scheduling system and automatically manipulates the radio station play schedule through a secure means.

2. An audience interaction system as set forth in claim 1 which further includes the option of alerting the audience as to when a selection will be played.

3. An audience interaction system as set forth in claim 2 wherein the alert is supplied by one or more of SMS texting, IM, E-mail, a mobile application and Social Media, which is cued by the radio station scheduling system.

4. An audience interaction system as set forth in claim 3 wherein the means of gathering the audience votes includes one or more of internet, mobile, cellular, and social media.

5. An audience interaction system as set forth in claim 4 wherein the system allows the audience to determine a next radio selection in real-time.

6. An audience interaction system as set forth in claim 4 wherein the system further allows the audience to play audio on demand through an audience interactive user interface.

7. An audience interaction system as set forth in claim 4 wherein the system further allows the audience to upload audio selections.

8. An audience interaction system as set forth in claim 1 with a configurable audience interaction user interface in which the audience may prioritize selections to play sooner or later in the radio station play schedule.

9. A method of providing audience interaction with the play schedule of a radio station which is determined by an automated radio scheduling system comprising the steps of:

a) gathering audience input as to a radio selection through the communication network;

b) regulating the audience input; and

c) interfacing with the automated radio scheduling system by means of an audience interaction system to automatically affect the scheduling of on-air content.

10. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 9 wherein the communication network includes one or more of the internet, telephone communication, television communication, and radio communication.

11. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 10 wherein the audience input includes votes on a plurality of selections.

12. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 11 further including the step of alerting the audience as to an up-coming voting event.

13. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 12 wherein the step of alerting uses one or more of SMS texting, IM, E-mail, a mobile application, and Social Media, which is cued by the radio station scheduling system.

14. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 9 wherein the audience interaction system allows the audience to determine a next radio selection in real-time.

15. A method of providing audience interaction as set forth in claim 9 with the play schedule of a radio station wherein the audience interaction system further allows the audience to play audio on demand through an audience interactive user interface.

16. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 9 wherein the audience interaction system further allows the audience to upload audio selections.

17. A method of providing audience ability to influence the play schedule of a radio station which is determined by an automated radio scheduling system comprising the steps of:

- a) gathering audience input electronically by staging a voting event to pick a selection from a plurality of selections;
- b) regulating the audience input to select a winning selection; and
- c) interfacing with the automated radio scheduling system by means of an audience interaction system to automatically affect the scheduling of on-air content so as to incorporate the winning selection into the play schedule of the radio station as a next selection in real time.

18. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 17 further including the step of alerting the audience as to an up-coming voting event.

19. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 18 wherein the step of alerting uses one or more of SMS texting, IM, E-mail, a mobile application, and Social Media, which is cued by the radio station scheduling system.

20. A method of providing audience interaction as set forth in claim 19 with the play schedule of a radio station wherein the audience interaction system further allows the audience to play audio on demand through an audience interactive user interface.

21. A method of providing audience interaction with the play schedule of a radio station as set forth in claim 17 wherein the audience interaction system further allows the audience to upload audio selections.

22. An audience interaction system as set forth in claim 3 wherein Social Media includes Facebook® or Twitter®, and users are empowered to share their votes and music preferences automatically through Social Media.

23. A software link which interfaces with a broadcast station operating system of a broadcast station, the broadcast station operating system operating with a broadcast station play schedule having a file at a file location, and with an external data source which determines a selection base upon audience criteria, wherein the software link determines the existence of the file and places a placeholder at the file location in the broadcast station play schedule and exports a selection determined by the external data source into the position of the placeholder to cause the broadcast station operating system to play the selection on-air.

24. A software system as set forth in claim 23 wherein the broadcast station is a radio station.

25. A software system as set forth in claim 23 wherein the audience criteria comprises audience input.

26. A software system as set forth in claim 4 wherein the audience input comprises a voting session or an open selection event.

27. A software link as set forth in claim 23 which allows the audience input determines a next selection in real-time.

28. A software link as set forth in claim 23 wherein the external data source communicates with the broadcast station operating system by means of the internet.

29. A software link as set forth in claim 23 wherein the external data source is an audience input system and the file location of the broadcast station play schedule comprises a definable location for new log exports and the software link forwards the broadcast station play schedule to the audience input system which places a placeholder in the definable location.

30. A software system as set forth in claim 29 wherein the audience input system uses a voting session or an open selection event to determine a selection to replace the placeholder.

31. A software system as set forth in claim 30 wherein the software system communicates with the audience input system via the internet.

32. A software system as set forth in claim 29 wherein the audience input system uses a voting session to rank a group of selections to determine an order to replace a group of placeholders with selections in the broadcast station play schedule.

33. A method of linking a broadcast station automation system of a broadcast station and an external data source using the internet comprising providing a software link which interfaces with the external data source and the broadcast station automation system which operates with a broadcast station play schedule having a file in a file location, wherein the software link determines the existence of the file in the play schedule and places a placeholder at that file location and exports a selection determined by the external data source into the file location of the placeholder to cause the broadcast station automation system to play the selection on-air in accordance with

set rules that optionally consider information exported from the radio station to the software link.

34. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 33 wherein the broadcast station is a radio station.

35. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 33 wherein the audience criteria comprises audience input.

36. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 35 wherein the audience input comprises a voting session or an open selection event.

37. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 33 which allows the audience input to determine a next selection in real-time.

38. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 37 wherein the external data source communicates with the broadcast station automation system by means of the internet.

39. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 38 wherein the external data source is an audience input system and the file location of the broadcast station play schedule includes a definable location for new log exports and the software link forwards the play schedule to the audience input system which places a placeholder in the definable location.

40. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 39 wherein the audience input system uses a voting session for an open selection event to determine a selection to replace the placeholder.

41. A method of linking a broadcast station automation system and an external data source using the internet as set forth in claim 40 wherein the software system communicates with the audience input system via the internet.